



FLORENCE COPPER INC.

1575 W. Hunt Highway, Florence, Arizona 85132 USA

florencecopper.com

February 20, 2019

Mr. David Albright
U.S. Environmental Protection Agency, Region 9
Drinking Water Protection Services, WTR-3-2
75 Hawthorne Street
San Francisco, California 94105-3901

**Re: Replacement Plan for Well M57 and Testing Procedures for the Production Test Facility
UIC Permit No. R9UIC-AZ3-FY11-1
Florence Copper, Florence, Arizona**

Dear Mr. Albright:

Florence Copper, Inc. (Florence Copper) is submitting the following in response to the Approval Letter from the United States Environmental Protection Agency, Region IX (USEPA) dated February 14, 2019. In the letter, USEPA is requesting additional information and clarification of the Replacement Plan for Well M57 and Temperature Logging and Radioactive Tracer Survey testing procedures submitted on January 14, 18, and 21, 2019. Florence Copper's responses to USEPA's comments are attached; each comment is shown in italics and is followed by our response in the order the comments were made. A revised Replacement Plan for M57 is also attached and the revision is inclusive of the comment responses included in this letter (Attachment 1).

We believe the following is responsive to USEPA's comments, and we are available to answer any questions you might have. Please contact me at 520-374-3984 if you require any additional information.

Sincerely,
Florence Copper Inc.

A handwritten signature in black ink, appearing to read "Dan Johnson", written over a horizontal line.

Dan Johnson
Vice President – General Manager

cc: Maribeth Greenslade, ADEQ
Nancy Rumrill, USEPA

Taseko

Comments on the Florence Copper MIT and Well Construction and Abandonment Procedures
Submitted in January 2019

Temperature Logging Procedures

1. The recovery wells should be shut in for a least 12 hours before temperature logging begins.

Response: Florence Copper agrees to the shut-in period for the recovery wells as specified in the above comment.

2. Injection wells should remain active and the recovery to injection rates should be maintained at a ratio of 110 percent while maintaining an inward gradient at the recovery wells to maintain hydraulic control during temperature logging of PTF wells. Hydraulic control should be maintained during logging of injection and recovery wells by adjusting injection rates and/or recovery rates in the active PTF wells.

Response: Florence Copper agrees to the requirements and conditions specified in the above comment.

3. In step 2 of the procedure, the temperature log should be recorded on a horizontal scale of 1-degree Fahrenheit per inch in addition to 5 degrees Fahrenheit per inch. A differential temperature track should be added to the final log.

Response: Florence Copper agrees to submit the temperature logs as specified in the above comment.

4. The original temperature survey run in each well should also be plotted on the log in Fahrenheit degrees for comparison with the post-injection surveys and MIT evaluation.

Response: Florence Copper agrees to plot the temperature survey run as specified in the above comment.

RAT Survey Procedures

For clarification purposes:

1. The log pass for the injectivity profile should be conducted with the well injecting at the normal operating pressure and at a stabilized injection rate.

Response: Florence Copper agrees with the requirement as specified in the above comment. However it should be noted that the normal operating pressure at the wellhead is zero pressure; the fluid does not reach the ground surface during normal operation.

2. The time drive and depth drive logging should be conducted at the maximum allowable injection pressure, if possible, but at no less than the normal operating pressure.

Response: The injection wells at Florence Copper are not operated with pressure at the wellhead; the injecting fluid level remains below ground surface at the current operational rates. Achieving the maximum allowable pressure is likely not possible with the existing equipment. The time drive and depth drive logging will be operated at under normal operating conditions.

3. The post-tracer gamma ray log should duplicate the logging speed, gain, depth setting and operating conditions applied for the pre-tracer baseline gamma ray log.

Response: Florence Copper will follow the specified requirements and conditions as specified in the above comment.

4. The preferred depth scale is 5 inches per 100 feet; however at least one of the scales presented should correspond to the reference log depth scale.

Response: Florence Copper will provide the data in the required reference log depth scale.

5. The operator should provide analytical interpretation of the logging results and a written description of the procedure, including the methodology used to calculate the wait-time, and conclusions drawn from the survey.

Response: Florence Copper will provide the specified information to USEPA as prescribed in the above comment.

M-57-0 Well Abandonment and Construction Procedures

Well Abandonment

The well abandonment procedures are acceptable as presented by FCI, except the signatures and dates are missing from EPA Form 7520-14, Plugging and Abandonment Plan.

Response The forms have been updated with signatures and dates, and are included in the Revised M57 Replacement Plan included as Attachment 1 to this letter.

Well Construction

Section 3.3, Well Casing Installation

Casing centralizers will be installed and secured to the well casing and screen at 40-foot intervals, but are not shown in Figure A of Appendix A, as stated in Section 3.3. Figure A should be revised to show the centralizer locations on the casing and screen intervals.

Response: The well diagram included Attachment 1 and in Appendix C has been revised to show casing centralizers.

Section 3.6, Mechanical Integrity Demonstration

For clarification, running temperature, gamma ray; cement bond logs, and other logs over the length of the steel casing should be specified here.

Response: Section 3.6 of the Revised M57 Replacement Plan, included as Attachment 1 to this letter, has been updated to include the cased-hole logging.

Final Well Construction Report and Completion of Construction Notice

FCI should comply with well construction reporting and notice of completion of construction requirements for the M-57-O-R well as specified at Part II.C.9 of the permit.

Response: Section 4 was added to the Revised M57 Replacement Plan, included as Attachment 1 to this letter, and includes the reporting requirements.

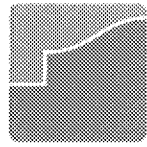
Monitoring Program

Water quality standards and baseline measurement methods should be followed for the M-57-O-R monitoring well consistent with the procedures specified in Part II.F of the permit and approved for the other monitoring wells.

Response: Florence Copper will conduct the baseline sampling program for the M-57-O-R monitoring well as specified in the above comment. The Revised M57-0 Replacement Plan has been updated to include the baseline monitoring and establishment of ALs and AQLs.

ATTACHMENT 1

Revised M57-O Well Construction and Abandonment Procedures



**FLORENCE
COPPER INC.**

**FLORENCE COPPER PROJECT
PRODUCTION TEST FACILITY**

**M57-O WELL CONSTRUCTION
AND ABANDONMENT PROCEDURES**

Prepared for:

U.S. EPA Region 9
75 Hawthorne Street (SFD-8-2)
San Francisco, CA 94105

Prepared by:

Florence Copper Inc.
1575 West Hunt Highway
Florence, AZ 85132

January 2019
Revised February 2019

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Appendix A – M57-O(R) Proposed Well Design

Appendix B – Proposed Location of M57-O(R)

Appendix C – Plugging and Abandonment Plans

1 INTRODUCTION

Florence Copper Inc. (Florence Copper) is currently operating the Production Test Facility (PTF) at the Florence Copper Project in Florence, Arizona. In accordance with the site Underground Injection Control (UIC) Permit No. R9UIC-AZ3-FY11-1 (Permit) and the *Conditional Authorization to Commence Injection for the Production Test Facility, UIC Permit No. R9UIC-AZ3-FY11-1* letter dated 14 December 2018, Florence Copper will abandon and replace well M57-O with well M57-O(R) located approximately 150 feet south of the existing well. This document describes procedures for abandonment and replacement of monitor well M57-O. The replacement well will be drilled and tested prior to abandonment of the existing monitor well.

After completion and development of M57-O(R), the well will be equipped with a dedicated QED MicroPurge pump for sampling. Appendix A shows the proposed well design and Appendix B shows the proposed well location. Appendix C includes the United States Environmental Protection Agency Plugging and Abandonment Plans.

The proposed well design was based on the lithologic contacts observed at the existing well M57-O. If the contacts vary, the well design will be modified prior to installation in order to ensure a cement seal is installed across the bedrock exclusion zone.

2 WELL ABANDONMENT

Well M57-O will be filled from the total depth to 5 feet below land surface (bls) with Type V neat cement grout. The blank casing will be perforated between 200 feet and the top of screen at 523 feet. Type V neat cement grout will be placed via tremie pipe; during grouting, the tremie pipe will remain submerged.

Perforation of the well casing will be conducted using the blast perforation method. Tremie pipe will be installed to the targeted depth for grout installation. Explosive charges will then be set inside the well casing at the specified perforation interval by a certified blasting technician. The well casing will be filled with Type V neat cement grout via submerged tremie pipe. As the well casing is filled with cement grout, the tremie pipe will be removed but will remain submerged. Once grout has reached ground surface and all tremie has been removed, the explosives will be detonated, perforating the casing and forcing wet grout into any voids behind the casing. Once the blast is cleared, the well will be topped off with Type V neat cement grout to 5 feet bls. The monument and the top 5 feet of the well will then be mechanically removed and backfilled with native material.

An abandonment diagram for well M57-O is included in the Plugging and Abandonment Plan in Appendix C.

3 WELL CONSTRUCTION

Well construction descriptions provided below include details of drilling; open-hole geophysics; casing, screen, and filter pack installation; and cementing.

3.1 Borehole Drilling

Borehole drilling consists of drilling a 20-inch diameter borehole to a minimum depth of 40 feet, then drilling a 12¼-inch borehole from the bottom of the surface casing to a minimum of 1,210 feet bls. The surface casing boring will be drilled using the auger or rotary method, and will be installed with the top of the surface casing above land to accommodate the mud-rotary drilling equipment. The annular seal will consist of Type V neat cement grout installed in the annulus between the surface casing and the borehole using the tremie method. The surface annular seal will extend from the land surface to the total depth of the surface casing.

The borehole in which the well will be constructed will be drilled from the bottom of the surface casing borehole to a minimum of 1,210 feet using the direct mud rotary or reverse circulation mud rotary drilling method, as conditions require. The well boring will be 12¼ inches in diameter.

3.2 *Open-Borehole Geophysics*

Open-hole geophysical logs will be run for the purpose of depth control and detection of borehole anomalies. Geophysical tools will include caliper, gamma-ray, temperature, directional survey, and electrical logs in accordance with the Permit.

3.3 *Well Casing Installation*

The well will consist of nominal 5-inch diameter blank casing material in the upper part of the well from land surface to a minimum of 40 feet below the top of bedrock. The blank casing will consist of Schedule 40 mild steel with either threaded or welded ends. Screen materials will be nominal 5-inch diameter Schedule 80 polyvinyl chloride with 0.020-inch slot openings. The end cap will be stainless steel.

During installation of the well casing and screen, the borehole will be kept full of drilling fluid and free of any obstructions detrimental to completing casing installation. The well casing and screen will be centered in the hole so as not to interfere in any way with the well installation. Casing installation will continue on a 24-hour per day, 7-day per week basis until completed.

Casing centralizers will be secured to the well casing and screen at 40-foot intervals, as shown in Appendix A. The casing and screen will be hung in tension, centered in the borehole, until all annular material has been installed.

Prior to installation of the casing, tremie pipe will be installed into the borehole. The tremie pipe will stay in place during casing installation and then will be used to place filter pack, annular seal materials, and cement within the annular space between the well casing and screen and the borehole wall. The tremie pipe will be removed from the well as construction and sealing operations are completed.

3.4 *Filter Pack and Intermediate Seal Installation*

Drilling fluid will be maintained throughout the full depth of the borehole to land surface, and the well casing and screen will be hung in tension until the filter material placement has been completed to the specified level, while the filter pack and intermediate seal materials are installed. During the time of placement, a rubber-flanged swab block will be used to swab the inside of the well screen in order to prevent bridging and aid in the settling of the filter pack in the borehole.

Filter pack will be placed to continuously fill the annulus to the specified level. Filter pack will be installed by use of the tremie pipe. At no time will the bottom of the tremie pipe be located at a distance of greater than 60 feet above the interval being filled during placement. Materials will be placed in accordance with the well design included in Appendix A.

The tremie pipe will be moved upward during installation of this interval, until the filter pack is installed above the uppermost well screen interval. The level of the filter pack will be measured periodically during placement with a wireline sounder. Placement of the materials will be continuous, except when additional precautions are necessary to prevent bridging or when measurements of the level are being conducted. The quantity of materials placed in the annulus will not be less than that of the computed volume.

The same tremie pipe will then be utilized for cementing the upper portion of the well casing as described below.

3.5 *Cementing*

The borehole for M57-O(R) will be of a constant diameter, drilled in a single stage. Once the well casing, screen, and filter pack have been installed in the boring, cementing of the upper portion of the well casing, from the bottom of the design interval to ground surface, will be accomplished by pumping a cement slurry down a tremie pipe positioned with the pipe's lower end near the bottom of the exclusion zone, forcing the cement to fill the annular space between the borehole and casing from the bottom up to the surface.

Cement grout will be placed to completely fill the well annulus within the specified interval. Prior to pumping, the cement grout will be passed through a ½-inch slotted bar strainer in order to remove any unmixed lumps. The discharge end of the tremie pipe will be continuously submerged in the grout until the zone to be grouted is completely filled.

The well casing will be hung in tension until the cement grout has cured. The well casing will be filled with a fluid of sufficient density to maintain an equalization of pressures to prevent collapse of the well casing during cementing.

Cement will consist of sulfate-resistant Portland Type V cement.

Water and/or appropriate mud-breaker chemicals will be circulated through the tremie pipe prior to cementing to reduce drilling mud viscosity and assist in removal of mud from the borehole-casing annulus.

The cement slurry will be pumped at the greatest flow rate possible to promote removal of drill mud from the annular space and enhance bonding between the cement and the casing and formation. An excess quantity of cement will be pumped into the annular space in order to verify "clean" cement slurry returns from the well prior to terminating the cementing procedure. Following installation of the cement slurry, the cement will be allowed to cure for a minimum of 24 hours before performing additional operations on the well.

3.6 *Mechanical Integrity Demonstration*

Upon completion of M57-O(R), a mechanical integrity demonstration will be conducted and reported in accordance with Part II.E.3(a) of the Permit.

This demonstration will include running cased-hole logs that include temperature, cement bond, gamma ray, fluid resistivity, and density logs over the length of the steel casing.

4 *REPORTING*

Florence Copper will complete well construction reporting and notice of completion of construction in accordance with Part II.C.9 of the Permit.

5 *MONITORING PROGRAM*

Florence Copper will collect eight baseline samples from well M57-O(R) for analysis of Level 1 and Level 2 parameters such that accepted statistical procedures can be applied to assign Alert Levels (ALs) and Aquifer Quality Limits (AQLs) in accordance with Part II.F.3 of the UIC permit. Samples will be collected on a monthly frequency and will be analyzed using the same statistical procedures applied previously to establish ALs and AQLs at M57-O and the other supplemental monitoring wells and point of compliance wells.

In accordance with Part II.F.3 of the Permit, Florence Copper will submit mean baseline concentrations, standard deviations, ALs, and federal AQLs to the Director. Once approved, well M57-O(R) will be included in the monitoring program and will be sampled for Level 1 and Level 2 parameters at the frequency defined in Part II.F.4 of the Permit.

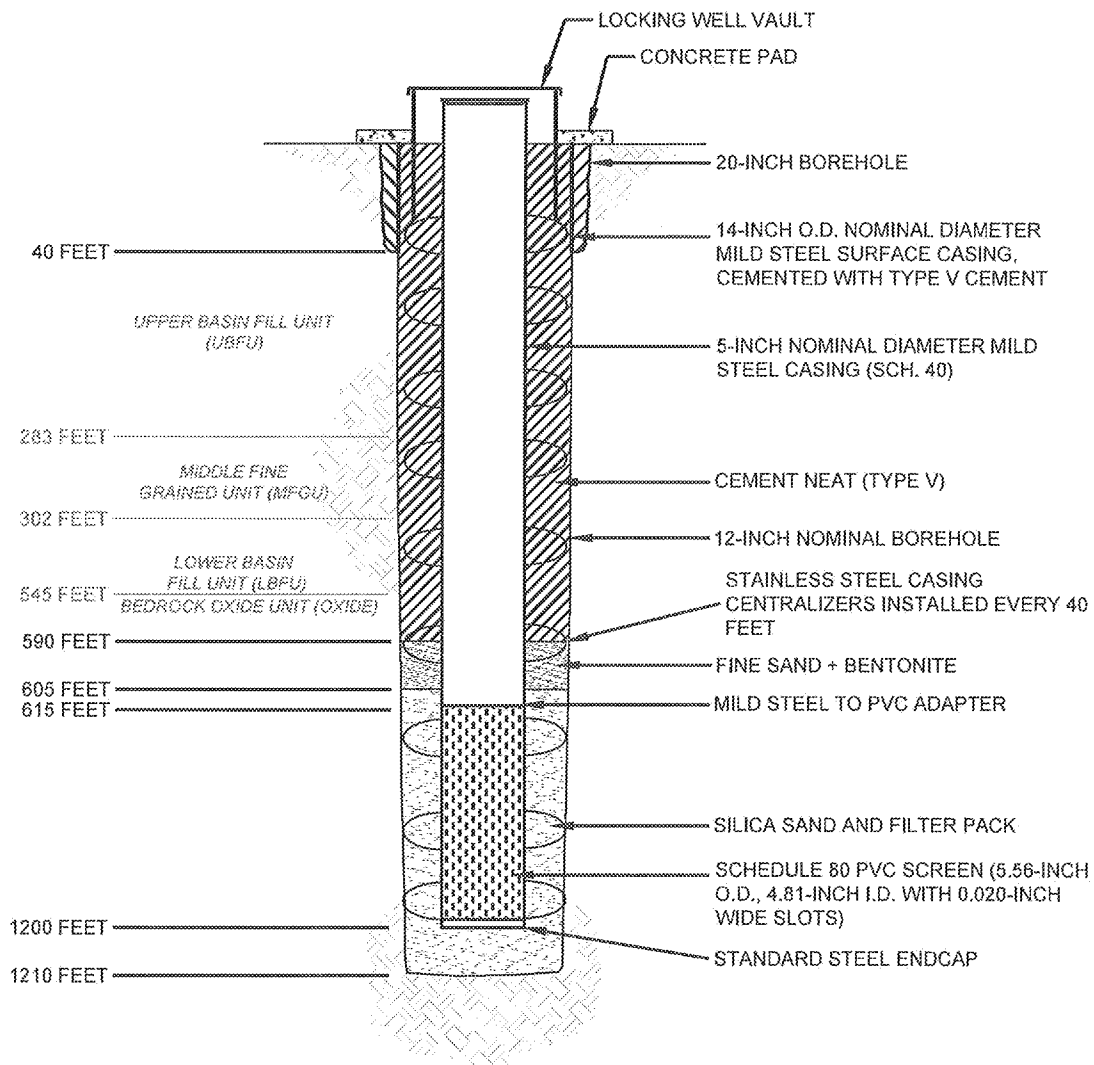
6 *PROPOSED CHANGES*

Florence Copper will give advance notice to the Director, as soon as possible, of any planned alterations or additions to this plan.

APPENDIX A

M57-O(R) Proposed Well Design

MOBINI DARIUSH Printed: 2/19/2019 2:35 PM Layout: M57-O
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NOTE

CASING CENTRALIZERS WILL BE INSTALLED EVERY 40 FEET

HALEY ALDRICH

PRODUCTION TEST FACILITY
 FLORENCE COPPER, INC.
 FLORENCE, ARIZONA

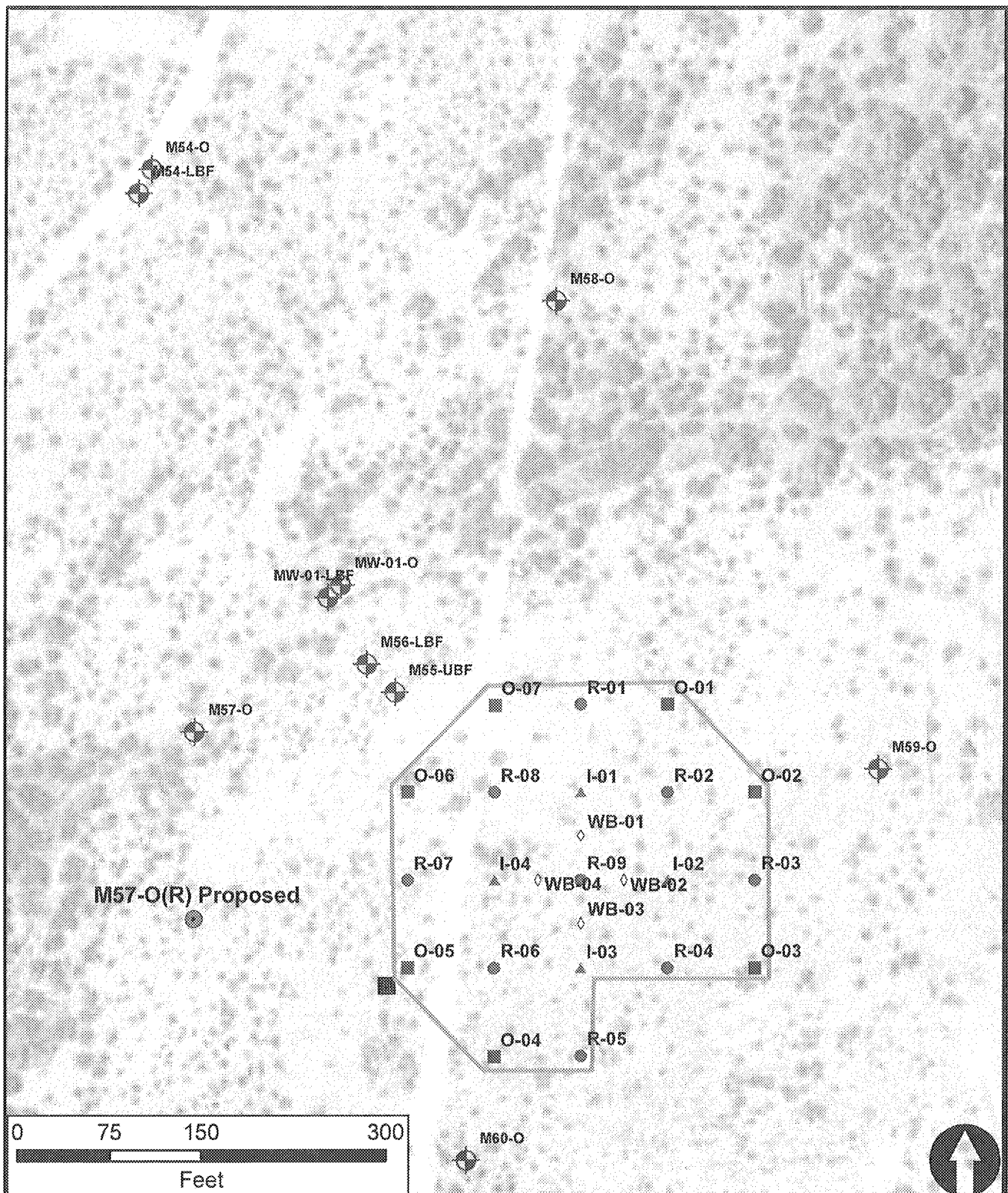
**M57-O (R)
 SUPPLEMENTAL MONITORING
 PROPOSED WELL DESIGN**

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
 FEBRUARY 2019

APPENDIX B

Proposed Location of M57-O(R)



Appendix B. Proposed Location of M57-O(R)



CLIENT: Florence Copper

PROJECT: PTF

JOB: M57-O(R) SCALE: 1:1,300

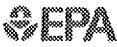
DRAWN: IR CHECKED: DJ

DATE: 12/26/1018

FIGURE: B

APPENDIX C

Plugging and Abandonment Plans


 United States Environmental Protection Agency
 Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

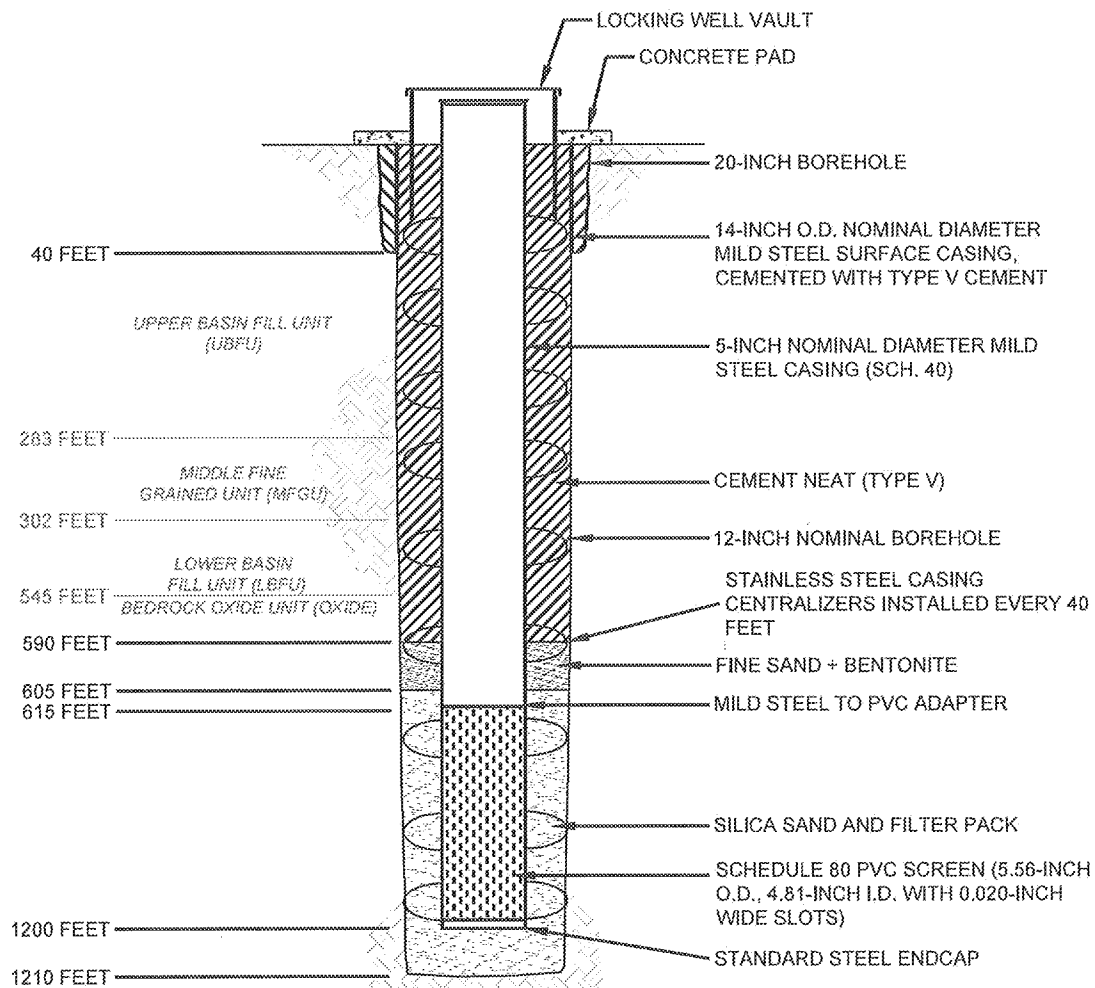
Name and Address of Facility Florence Copper Project 1575 W Hunt Hwy, Florence AZ 85132		Name and Address of Owner/Operator Florence Copper 1575 W Hunt Hwy, Florence AZ 85132																																																																			
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<div style="text-align: center;"> Certification I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32) </div>																																																																					
Name and Official Title (Please type or print) Ian Beam Senior Hydrogeologist		Signature 			Date Signed 2-19-2019																																																																

Paperwork Reduction Act Notice

The public reporting and record keeping burden for this collection of information is estimated to average 4.5 hours for operators of Class I hazardous wells, 1.5 hours for operators of Class I non-hazardous wells, 3 hours for operators of Class II wells, and 1.5 hours for operators of Class III wells.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Please send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Office of Environmental Information, Collection Strategies Division, U.S. Environmental Protection Agency (2822), Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, Attention: Desk Officer for EPA. Please include the EPA ICR number and OMB control number in any correspondence.



NOTE

CASING CENTRALIZERS WILL BE INSTALLED EVERY 40 FEET

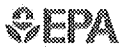
HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

M57-O (R)
SUPPLEMENTAL MONITORING
PROPOSED WELL DESIGN

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
FEBRUARY 2019



United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

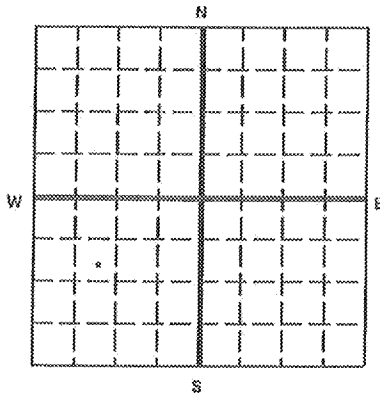
Name and Address of Facility

Florence Copper Project
1575 W Hunt Hwy, Florence AZ 85132

Name and Address of Owner/Operator

Florence Copper
1575 W Hunt Hwy, Florence AZ 85132

Locate Well and Outline Unit on
Section Plat - 640 Acres



State

Arizona

County

Pinal

Permit Number

AZ396000001

Surface Location Description

NE 1/4 of SE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 060 ft. from (N/S) N Line of quarter section
and 1265 ft. from (E/W) W Line of quarter section.

TYPE OF AUTHORIZATION

- ☐ Individual Permit
☒ Area Permit
☐ Rule

Number of Wells 1

Lease Name

NA

WELL ACTIVITY

- ☐ CLASS I
☐ CLASS II
☐ Brine Disposal
☐ Enhanced Recovery
☐ Hydrocarbon Storage
☒ CLASS III

Well Number

M57-O

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
14	36.71	40	40	17.5
5	14.63	523	523	10.625
5	2.73	676	676	10.625

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒ The Balance Method
☐ The Dump Bailer Method
☐ The Two-Plug Method
☐ Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	5						
Depth to Bottom of Tubing or Drill Pipe (ft)	1199						
Sacks of Cement To Be Used (each plug)	126						
Slurry Volume To Be Pumped (cu. ft.)	163						
Calculated Top of Plug (ft.)	5						
Measured Top of Plug (if lagged ft.)	NA						
Slurry Wt. (Lb./Gal.)	15.4						
Type Cement or Other Material (Class III)	V						

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To
523	1199		
200	523		

Estimated Cost to Plug Wells

12,500

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Don Ream Senior Hydrogeologist

Signature

Date Signed

2-19-2019

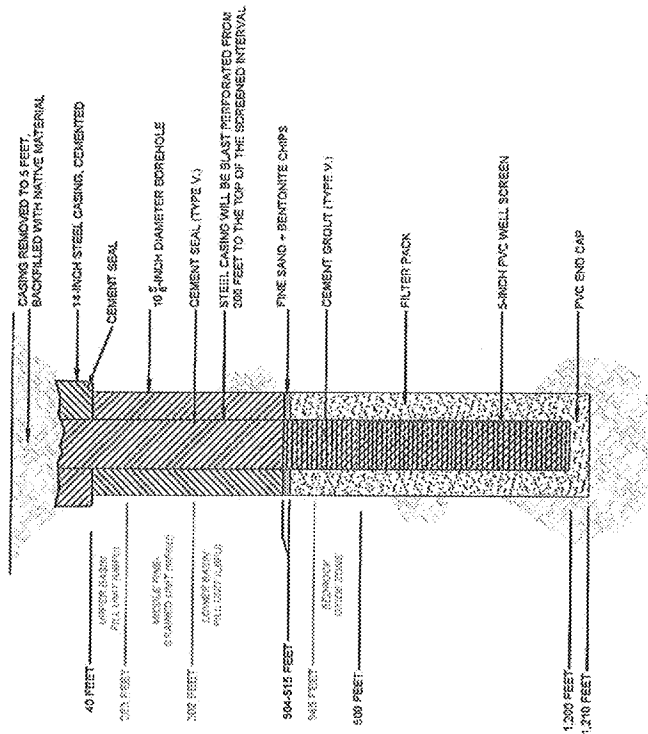
Paperwork Reduction Act Notice

The public reporting and record keeping burden for this collection of information is estimated to average 4.5 hours for operators of Class I hazardous wells, 1.5 hours for operators of Class I non-hazardous wells, 3 hours for operators of Class II wells, and 1.5 hours for operators of Class III wells.

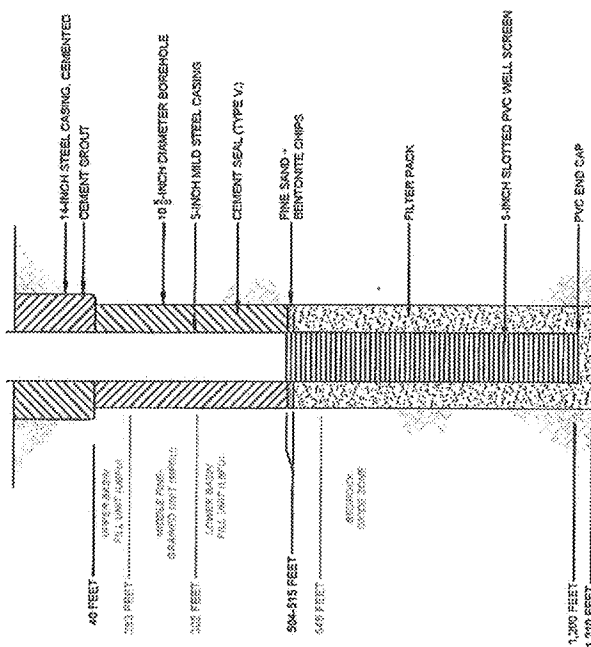
Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

Please send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Office of Environmental Information, Collection Strategies Division, U.S. Environmental Protection Agency (2822), Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, Attention: Desk Officer for EPA. Please include the EPA ICR number and OMB control number in any correspondence.

PROPOSED PLUGGING
AND ABANDONMENT
M57-O Cased Well



AS-BUILT
M57-O Cased Well



FLORENCE COPPER, INC.
PRODUCTION TEST FACILITY
FLORENCE, ARIZONA

M57-O WELL ABANDONMENT
DIAGRAM

SCALE AS SHOWN
DECEMBER 2019

FIGURE 1